

## Determinants of Educational Service Quality in Shiraz University of Medical Sciences using Servqual and Kano Models

Hamed Rahimi<sup>1</sup>, Zahra Kavosi<sup>2\*</sup>, Parvin Qanbari<sup>3</sup>, Lale Heidary<sup>3</sup>

Received 24 Feb 2015; Accepted 8 Apr 2015

### ABSTRACT

**Introduction:** The quality of education sector is worth considering as this system has a significant effect on the economic growth of the country. This study aimed to determine the quality gap and rank the student's expectation of educational services provided in Shiraz University of Medical Sciences in 2013.

**Method:** This research included two cross-sectional phases. The sample size of both phases included 220 students selected using multistage sampling. Servqual questionnaire was used in the first study which was designed to find the quality gap of the education system's services. The data were entered into the SPSS statistical software and analyzed using descriptive statistics and Paired-Sample T-Test. Kano's two-dimensional questionnaire was used in the second phase. Each indicator of quality which had a negative gap at a significance level of 5% in the first study was introduced to Kano's two-dimensional questionnaire. Finally, better value and worse value formulas were used to analyze the data obtained in this step.

**Results:** The results revealed that all quality items had a significance negative gap which were recognized as the voice of customers ( $P < 0.05$ ). Frequency analysis was done to determine the frequency of repetition. Accordingly, 11 out of the 30 requirements were identified as must be requirements and 19 as one-dimensional requirements.

**Conclusion:** This study can help the authorities prioritize their policies, strategies and decisions in order to improve and guarantee the higher education quality and extremity obtains customer satisfaction.

**Keywords:** Educational services, Expectations, Perceptions, Servqual, Kano model

► Please cite this paper as:

Rahimi H, Kavosi Z, Qanbari P, Heidari L. Determinants of Educational Service Quality in Shiraz University of Medical Sciences using Servqual and Kano Models. *J Health Man & Info*. 2015;2(3):74-81.

### Introduction

Education sector is expanding very rapidly all over the world in the recent years. Additionally, globalization and digital revolution have created a demand for new and varied disciplines in education (1). Higher education enhances employment skills and is a source of new technologies. It is also a key factor in developing a country's international competitiveness (2). Besides, the quality of education systems has a significant effect on the economic growth as it prepares the human resources for working better in each economic system (3). It is of note that educational system and economic growth have a reciprocal relationship. As mentioned before, "a good educational system may be the flower of economic development, but it is also the seed".

In this widely changeable world that is getting increasingly uncertain, all Higher Education Institutes (HEIs) need to look for appropriate responses to social needs (4). Confrontation with many rapid changes and challenges as

well as the increasing competition among organizations has forced HEIs to be more dynamic in focusing on their customers in order to improve their creditability (5).

The interface between HEIs and students is more complex than before. Moreover, expectations of today's students combined with an increasingly competitive market and the demand for lifelong learning presents a host of challenges and opportunities to HEIs (6).

The concept of student satisfaction has attracted much attention in the recent years and has become one of the major goals of all educational institutions. The students' satisfaction strongly depends on the efforts regarding the quality of the provided services. Therefore, HEIs should listen to and satisfy their students (7). Furthermore, service quality plays an important role in sustaining the profit levels of companies; consequently, it is a vital element in creating customer satisfaction. Thus, measurement of the service quality deserves special attention (8). The quality of university education has become a topic of

<sup>1</sup> Department of Health Services Administration, Student Research Committee, Kerman University of Medical Sciences, Kerman, Iran

<sup>2</sup> Department of Health Services Administration, Shiraz University of Medical Sciences, Shiraz, Iran

<sup>3</sup> Department of Health Services Administration, Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

\*Corresponding Author: Z Kavosi, School of Management and Medical Informatics, Shiraz University of Medical Sciences, Shiraz, Qsraldsh Street, and Alley 29, Iran, Email: zhr.kavosi@gmail.com.

major importance generated by the labor market that has narrowed a lot lately and, at the same time, it has become more demanding (3). Hence, HEIs are trying to specify the most important attributes for the services that help satisfy the customers' needs and improve their popularity. One complicated challenge before the universities on their path to the achievement of this goal is how to design studies on identifying and realizing today's and future's needs and expectations (5). A review of the related literature proves that quality improvement in higher education has been addressed in different ways in different articles on this topic (9). In measurement of the service quality, Servqual instrument has been highlighted by its wide applicability (10). Besides, "Kano model" is used to categorize the customer needs. In this study, first the current and the ideal situations of the indicators of the quality of Shiraz University of Medical Sciences educational services were compared according to the students' opinions. Then, the nature and type of any one of these factors were identified using Kano Model. Finally, better value and worse value were estimated for any one of the quality indicators to identify the level to which any of these indicators affect the increase or decrease of customer satisfaction.

**Servqual instrument:** Since the nature of the "product" is intangible in the services sector, measuring the service quality involves complex processes. For exploring and assessing the customers' experiences about the services they have received, the service quality scale (Servqual) devised by Parasuraman et al. has been widely used in the current literature. Servqual includes five dimensions of service quality and measures the gap between the customers' expectations and their experiences(8). regarding the perspective of higher education, these five dimensions are considered: (1) Tangibility: physical facilities, equipment and appearance of the university staff, (2) Reliability: the ability to perform the promised services dependably and accurately, (3) Responsiveness: the willingness to help students and provide prompt advice and services, (4) Security: the ability of the university staff to demonstrate competence, confidence, courtesy, credibility and security, and (5) Empathy: the ability to care and provide individualized attention to students. Considering these dimensions of quality, service quality is determined as the difference between student expectations and perceptions of service delivery quality. In general, consumers are dissatisfied only if the experienced quality is worse than what is expected(10).

**Kano model:** Among the instruments and methods designed to help organizations understand the customer requirements, Kano Model is an instrument that has been widely used to perceive the voice of customers in order to influence customer satisfaction(11).

In fact, Noriaki Kano was the first person to develop a method to identify user requirement and expectation through a preference classification technique (Kano et al., 1984). This model is used to categorize customer needs and is able to determine the users' requirement. Overall, there are six categories of requirements which influence the user satisfaction in different ways:

*Must be quality indicators:* These attributes are the

basic criteria for a product or service, the lack of which will make the customers quite dissatisfied. However, the fulfillment of these attributes will not increase the customer satisfaction.

*One-dimensional quality indicators:* These attributes have a positive and linear relationship with customer satisfaction. Therefore, the more these attributes are realized, the more satisfied the customers will be. On the contrary, the lesser these attributes are realized, the lesser satisfied the customers will be. In other words, users will be satisfied if the qualities are fulfilled and dissatisfied if they are not fulfilled.

*Attractive quality indicators* include some attributes of services or products whose presence leads to customer satisfaction; however, their absence will not result in dissatisfaction. In other words, their presence enhances user satisfaction, but if they are not met, users will not be dissatisfied.

*Indifferent quality indicators:* Their presence or absence will not influence the satisfaction or dissatisfaction of customers.

*Reverse quality indicators:* Their presence leads to customers' dissatisfaction and their absence causes their satisfaction.

*Questionable indicators:* This is when the customer has not perceived the question or the information provided by the question is not sufficient. In other words, the customer is doubtful about the criterion (5, 11-14).

## Methods

The current survey included two cross-sectional phases conducted in Shiraz University of Medical Sciences, Shiraz, Iran. The results of the first survey were used in the second one. The sample size of each phase included 220 students who were selected using multistage sampling. In the first stage, each collage was considered as a stratum. Then, the students were randomly selected from each collage. The formula below was used in determination of the sample size: ( $\alpha=0.05$ ,  $\beta=0.2$ ,  $S=0.6$ ,  $d=0.1$ )

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \cdot S^2}{d^2}$$

Data collection in these two phases was done as follows:

**First phases:** Servqual questionnaire was used in the first phase. This questionnaire was designed to analyze the current and the ideal situation of the education system's services. It included demographic questions and 30 indicators of five dimensions of service quality, i.e. Tangibles, Reliability, Responsiveness, Assurance, and Empathy. We measured the perceptions and expectations of the students about service quality. A 5- point Likert Scale (1=Very little to 5=Very Much) was used to scale the responses. The validity of the questionnaire was approved by 9 professors and experts. Besides, its reliability was confirmed by Chronbach's  $\alpha=0.901$ (15).

The quality gap was calculated by subtracting the expectation score of each item from its perception

score. A positive score difference would indicate that the quality of the educational services was higher than expected, whereas a negative score difference would mean that educational services did not meet the students' expectations and that a quality gap existed. Finally, if the difference of the resulting scores was zero, it would signify the absence of any quality gap between the perceived and expected educational services provided to the students (16). Afterwards, the data were entered into the SPSS statistical software (v.18) and analyzed, using descriptive statistics and Paired-Sample T-Test). In the first phase, Kolmogorov-Smirnov test showed that the collected data were normally distributed. Thus Paired-Sample T-Test was used to compare the students' perceptions and expectations regarding the 30 quality indicators and to identify the customers' (students') require (Kano's two-dimensional questionnaire).

**Second phases:** Kano's two-dimensional questionnaire was used in the second phase. Each indicator of quality which had a negative gap at a significance level of 5% in the first phase was introduced to Kano's two-dimensional questionnaire. The face validity of Kano's questionnaire was approved by 5 experts. Finally, Kano's questionnaire analysis table and better value and worse value formulas were used to analyze the data obtained in this step (Table 1).

$$\text{Better} = \frac{A+O}{A+O+M+I}$$

$$\text{Worse} = -\frac{O+M}{A+O+M+I}$$

Considering the formulas, better value shows to what extent customer satisfaction can be increased by improving the quality elements, while worse value shows to what extent non-fulfillment of the quality elements can reduce satisfaction. Better value and worse value are between zero and one. If the value of an element approaches zero, that element has a low level of influence. Besides, a better value closer to one indicates that the element has positively influenced the user satisfaction. However, a worse value closer to one indicates that the element has decreased the customer dissatisfaction. Therefore, we can understand how and to what extent an element can influence the user satisfaction. Moreover, focusing on every element can increase the satisfaction and prevent the decrease of user dissatisfaction (5, 13, 17). A table was formed to evaluate the frequency of answer to the Kano questions. Cross matching was done with the answers to the pair of functional and dysfunctional questions. Better value and worse value were computed using excel software.

**Table 1.** Analysis of Kano's questionnaire (Bilsen Bilgili et al.)

Customer requirements		Dysfunctional (negative) question				
		like	Must-be	neutral	Live with	dislike
Functional (positive) question	Like	Q	A	A	A	O
	Must-be	R	I	I	I	M
	Neutral	R	I	I	I	M
	Live with	R	I	I	I	M
	Dislike	R	R	R	R	Q

Customer requirement is A: Attractive, M: Must-be, O: One-dimension, I: Indifferent, R: Reverse, or Q: Questionable

**Better value and worse value:** It seems that using the mode indicator in the analysis of Kano Model cannot be reliable. Therefore, to come to a more comprehensive view about the results of Kano Model, the role of each element in increasing or decreasing the customer satisfaction can be identified by measuring better value and worse value for every quality indicator. Better value was obtained by adding up the attractive and one-dimensional quality responses and then dividing the sum by the total number of attractive, one-dimensional, must-be and indifferent responses. On the other hand, worse value is obtained by adding up the must-be and one-dimensional quality responses and then dividing the sum by the total number of attractive, one-dimensional, must-be, and indifferent responses and putting a minus before the answer. These formulas are presented below:

## Results

The response rates of the first and second studies were 100% and 87%, respectively. All the 220 students participated in the first study. Among these students, 147 (66.8%) were female. In addition, the mean age of the respondents was 23.23 years (SD=3.28). Besides, 85 (38.6%), 71 (32.3%) and 64 students (29.1%) were undergraduate, postgraduate and PhD, and GP students, respectively.

The results revealed that all the 30 items had a negative gap at a significance level of 0.05 and, as a result, they were recognized as the voice of customers ( $P<0.05$ ). The results also showed that the expectations of the students were higher than the current situation in all the aspects of quality (Table 2).

**Table 2.** The comparison of students' perceptions and expectations about the quality of educational services in Shiraz University of Medical Sciences 2013

Row	Requirements	Mean of Expectations	Mean of Perceptions	Mean Gap	t	P-value
<b>Tangibles</b>	Adorned and professional appearance of professors	4.52±0.71	3.32±1.03	-1.2±1.07	-16.553	<0.001
	External beauty of the physical facilities (building, classrooms, chairs and place of rest)	4.62±0.68	2.59±1.08	-2.03±1.33	-22.619	<0.001
	External beauty of the items (books, pamphlets, etc.) that teachers use in teaching	4.4±0.77	2.91±1.04	-1.5±1.24	-17.934	<0.001
	Effectiveness and novelty of college's equipment and materials (internet, library, video projectors, etc.)	4.5±0.74	3.3±1.16	-1.2±1.37	-12.958	<0.001
	Total	4.51±0.55	3.03±0.77	-1.48±0.88	-24.924	<0.001
<b>Reliability</b>	Putting promises into action	4.55±0.77	2.45±1.13	-2.1±1.32	-23.590	<0.001
	Timely service provision	4.51±0.75	2.57±1.08	-1.94±1.28	-22.509	<0.001
	Informing the students regarding the results of their evaluation	4.46±0.74	2.9±1.26	-1.56±1.36	-16.979	<0.001
	Giving better scores to students in case they make more efforts	4.53±0.8	3.27±1.31	-1.26±1.46	-12.745	<0.001
	Presenting organized and related content in each class session	4.6±0.63	3.29±1.17	-1.21±1.26	-14.260	<0.001
	Total	4.53±0.56	2.91±0.88	-1.62±0.99	-24.179	<0.001
<b>Assurance</b>	Facilitation of discussions about the subject matters by the instructors	4.54±0.66	3.04±1.17	-1.5±1.25	-17.778	<0.001
	Providing appropriate research resources, updates and 24-hour access to students for further studying	4.51±0.76	2.83±1.22	-1.68±1.36	-18.282	<0.001
	Preparing students for future jobs by providing theoretical and practical training in schools	4.72±0.54	2.75±1.24	-1.98±1.34	-21.896	<0.001
	Existence of a good relationship between teachers and students	4.59±0.67	3.29±1.22	-1.3±1.31	-14.717	<0.001
	Existence of feedback at various stages of training	4.4±0.77	2.83±1.08	-1.57±1.18	-19.678	<0.001
	Suitable and sufficient time for consultation	4.55±0.72	2.75±1.32	-1.8±1.47	-18.259	<0.001
	Educational programs with high quality	4.65±0.66	2.71±1.09	-1.93±1.26	-22.797	<0.001
	Diversity of extracurricular educational programs	4.47±0.85	2.42±1.27	-2.05±1.57	-19.258	<0.001
	The university's reputation for educational programs among other universities	4.55±0.82	2.66±1.3	-1.89±1.45	-19.323	<0.001
	Flexible course structures	4.43±0.79	2.6±1.11	-1.83±1.37	-19.839	<0.001
	Faculty members with the experience of working abroad	4.69±0.65	3.36±1.28	-1.33±1.33	-14.826	<0.001
	Total	4.56±0.51	2.84±0.8	-1.72±0.91	-27.983	<0.001
<b>Empathy</b>	Assigning appropriate, related homework (not to little not too much)	4.43±0.76	2.97±1.33	-1.46±1.31	-16.459	<0.001
	Paying special attention to each individual	4.49±0.81	2.62±1.28	-1.87±1.49	-18.617	<0.001
	Resolving the specific needs of each student confidentially	4.41±0.88	2.61±1.32	-1.8±1.52	-17.489	<0.001
	Appropriate behavior of the university staff towards students	4.63±0.75	3.18±1.4	-1.45±1.51	-14.156	<0.001
	Respectful behavior of instructors towards students	4.69±0.64	3.72±1.22	-0.96±1.28	-11.184	<0.001
	Total	4.53±0.61	3.02±0.99	-1.51±1.11	-20.181	<0.001
<b>Responsiveness</b>	Students having easy access to the manager to mention their views about educational issues	4.57±0.71	2.86±1.29	-1.7±1.45	-17.449	<0.001
	Existence of feedback systems for improvement of the quality of university services	4.46±0.78	2.65±1.12	-1.81±1.31	-20.507	<0.001
	Existence of standard procedures	4.55±0.73	2.85±1.13	-1.69±1.27	-19.811	<0.001
	Availability of advisors when necessary	4.6±0.72	2.95±1.26	-1.65±1.35	-18.096	<0.001
	Equal and non-discriminatory behavior and consideration	4.66±0.68	2.97±1.32	-1.69±1.41	-17.755	<0.001
	Total	4.57±0.55	2.85±0.92	-1.72±1.02	-24.967	<0.001
	Overall quality of services	4.55±0.47	2.91±0.73	-1.64±0.83	-29.346	<0.001

**Table 3.** The results of Kano's questionnaire analysis about the educational services in Shiraz University of Medical Sciences 2013

Dimension	Customer Requirements	M	O	A	I	R	Q	Total	Grade	Better	Worse
<b>Tangibles</b>	Adorned and professional appearance of professors	61	80	36	15	-	-	192	O	0.61	-0.74
	External beauty of the physical facilities (building, classrooms, chairs and place of rest)	55	88	31	18	-	-	192	O	0.62	-0.75
	External beauty of the items (books, pamphlets, etc.) that teachers use in teaching	56	84	23	29	-	-	192	O	0.56	-0.73
	Effectiveness and novelty of college's equipment and materials (internet, library, video projectors, etc.)	86	75	19	12	-	-	192	M	0.49	-0.84
<b>Reliability</b>	Putting promises into action	86	81	15	10	-	-	192	M	0.5	-0.87
	Timely service provision	88	71	21	12	-	-	192	M	0.48	-0.83
	Informing the students regarding the results of their evaluation	82	61	27	18	4	-	192	M	0.47	-0.76
	Giving better scores to students in case they make more efforts	67	92	15	16	2	-	192	O	0.56	-0.84
	Presenting organized and related content in each class session	73	75	25	19	-	-	192	O	0.52	-0.77
<b>Assurance</b>	Facilitation of discussions about the subject matters by the instructors	57	86	31	18	-	-	192	O	0.61	-0.75
	Providing appropriate research resources, updates and 24-hour access to students for further studying	56	82	23	31	-	-	192	O	0.55	-0.72
	Preparing students for future jobs by providing theoretical and practical training in schools	76	86	14	16	-	-	192	O	0.52	-0.84
	Existence of a good relationship between teachers and students	52	115	17	8	-	-	192	O	0.69	-0.87
	Existence of feedback at various stages of training	65	84	27	15	-	-	192	O	0.58	-0.78
	Suitable and sufficient time for consultation	57	77	31	25	2	-	192	O	0.57	-0.70
	Educational programs with high quality	73	86	25	8	-	-	192	O	0.58	-0.83
	Diversity of extracurricular educational programs	50	90	29	23	-	-	192	O	0.62	-0.73
	The university's reputation for educational programs among other universities	61	88	31	12	-	-	192	O	0.62	-0.78
	Flexible course structures	60	88	21	21	2	-	192	O	0.57	-0.78
<b>Empathy</b>	Faculty members with the experience of working abroad	59	77	21	35	-	-	192	O	0.51	-0.71
	Assigning appropriate, related homework (not to little not too much)	62	72	24	23	11	-	192	O	0.53	-0.74
	Paying special attention to each individual	63	75	25	25	4	-	192	O	0.53	-0.73
	Resolving the specific needs of each student confidentially	82	88	10	12	-	-	192	O	0.51	-0.88
	Appropriate behavior of the university staff towards students	92	86	12	2	-	-	192	M	0.51	-0.93
<b>Responsiveness</b>	Respectful behavior of instructors towards students	88	81	17	6	-	-	192	M	0.51	-0.88
	Students having easy access to the manager to mention their views about educational issues	80	77	27	8	-	-	192	M	0.54	-0.82
	Existence of feedback systems for improvement of the quality of university services	84	69	25	14	-	-	192	M	0.49	-0.8
	Existence of standard procedures	94	71	19	8	-	-	192	M	0.47	-0.86
	Availability of advisors when necessary	103	69	10	10	-	-	192	M	0.41	-0.9
Equal and non-discriminatory behavior and consideration	100	69	15	8	-	-	192	M	0.44	-0.88	

Since all the items had a negative gap at a confidence level of 95%, they were introduced to Kano's two-dimensional model in order to determine to which class of customer requirements they belonged. According to the results of frequency analysis carried out to determine the frequency of repetition, 11 out of the 30 requirements was identified as must be, and 19 as one-dimensional requirements. Finally, to more properly investigate the role of each quality element in increasing and decreasing the customer dissatisfaction, better value and worse value were measured for each attribute (Table 3).

## Discussion

In the first phase of the study, the students' perception of and expectation from the quality of educational services of Shiraz University of Medical Sciences were compared. According to the results, negative gaps existed in all the five dimensions of Servqual and its determinant. The highest negative mean score gap was in the responsiveness and assurance dimensions (-1.72) and the lowest was in the tangibles dimension (-1.48). Besides, the highest mean score of expectations was related to "preparing students for future jobs by providing theoretical and practical training in schools" and the lowest mean score of perception was related to "diversity of extracurricular educational programs" (Table 2). Quality gap in all the aspects indicates the existence of a lot of fields and opportunities for improving the quality of educational services and customer satisfaction. Determining the service quality gaps can act as an appropriate basis for planning, priority setting, and decision-making about resource allocation.

Similarly, the results of the study by Foroughi Abari et al. conducted on the quality of educational services in a non-governmental university represented a negative gap in the five dimensions of service quality. According to their study, the responsiveness and assurance dimensions had the highest and lowest negative gaps, respectively (Mean of Exp=4.03 and mean of Per=3.51) (18). Also, the study performed by Akhlaghi et al. in Ahvaz technical and vocational girl colleges in Iran indicated quality gaps in all the service quality dimensions, with the most and least outstanding gaps being related to responsiveness and reliability dimensions, respectively (Mean of Exp=6.09 and mean of Per=3.07) (19). In the same line, a study by Barnes on the analysis of the educational services quality gap using Servqual method among Chinese postgraduate students showed a negative gap in all aspects of service quality. (Mean of Exp=5.73 and mean of Per=4.73) (20). Finally, a study by Husain et al. using Servqual method, as an instrument to measure the satisfaction and dissatisfaction of educational experiences, showed that student satisfaction was associated with the course structure, content, feedback, and assessment as well as the administration quality (21). The results of these studies indicated different levels of negative quality gaps. Comparison of the results of these studies shows that the quality gap in Shiraz University of Medical Sciences was more than that of the studies by Foroughi and Barnes and less than that of Akhlaghi research.

In the first phase, we found negative gaps in all aspects

of quality. However, in order to suggest operational recommendations for university managers to improve the quality of their services considering the limitation of resources, it is necessary to rank the indicators of each aspect based on the students' viewpoints. This was achieved by the results of Kano's two-dimensional model in the second phase.

The results showed that out of the 30 identified requirements, 11 and 19 were categorized as must be and one-dimensional requirements, respectively. Must be requirements are the basic attributes that need to be taken into further consideration in order to avoid at least the students' dissatisfaction. Nevertheless, existence of these requirements will not increase the students' satisfaction. After fulfilling these basic requirements, we can hope that the universities take a step toward promoting of quality and increasing the students' satisfaction.

The most frequently repeated must be requirements in this study included "availability of advisors when necessary" and "equal and non-discriminatory behavior and consideration". This implies that based on the students' view, availability of faculty members and professors is considered as basic minimum requirements of educational services and just prevent the students' dissatisfaction. Furthermore, the most frequently repeated one-dimensional requirements included "existence of a good relationship between teachers and students" and "giving better scores to students in case they make more efforts". Therefore, the professor communication skills and respectful behaviors with students increased their satisfaction, while bad communication manner increased their dissatisfaction (Table 3). These aspects of quality which are not that much resource consuming can be improved through educational workshops.

Overall, the results showed that "existence of a good relationship between teachers and students" was most effective in increasing the customer satisfaction. Additionally, "appropriate behavior of the university staff towards the students" and "availability of advisors when necessary" were most influential in decreasing the students' dissatisfaction (Table 3).

The results of the study by Arefi et al. conducted to identify the students' requirements regarding the quality of master's degree Educational Psychology program in state universities of Tehran, 41 items were analyzed as program quality indicators. The results revealed that 27 out of the 41 had negative gaps at a significance level of 0.01 and, consequently, they were recognized as the voice of customers ( $P < 0.01$ ). Hence, these elements were introduced to Kano's two-dimensional model. According to the findings, out of the 27 indicators, 5, 7, 9, and 6 belonged to attractive, one-dimensional, must be, and indifferent elements of quality, respectively. Moreover, it was revealed that "existence of incentives and facilities for improving educational and research activities of the students" and "acceptance of criticisms by the professors" had the highest influence on increasing the students' satisfaction. Besides, "the students' ability to carry out research studies" and "being involved in teaching-learning processes" had the highest influence on decreasing student

dissatisfaction (5).

Furthermore, Kazemi et al. used Kano model to identify and rank the factors affecting Maskan Bank service quality in Mashhad, Iran. Based on the study findings, “the least time standing in line” and “the emotional relationship with bank employees” had the maximum and minimum impacts on customer satisfaction, respectively. The results also showed that “non-availability of some other facilities, such as water cooler and chairs” had the highest and “the emotional relationship with bank employees” had the lowest impact on customer dissatisfaction (22).

Bilgili believes that classification of consumer requirements using Kano model and development of products according to this classification is useful for providing consumer satisfaction. This model is also assumed to be useful for the researchers who intend to study about developing new products or services (12).

The frequency of factors in one-dimensional requirement shows that the university has more options to choose in order to improve the students’ satisfaction. On the other hand, there are fewer options which should be taken into consideration to decrease their dissatisfaction. Kano model reminds Herzberg’s two factor theory of motivation. In fact, hygiene and motivation factors in Herzberg’s model can be similar to must be and one-dimensional factors in Kano’s model (23).

In the present study, lack of factors in the attractive requirements indicates the students’ very high level of awareness which causes them not to be excited by these services. This may be due to the high quality of today’s educational services and also indicates competition between universities in improving the quality of their services. Thus, it seems that Shiraz University of Medical Sciences should first focus on must be requirements to ensure that the students are not dissatisfied and then try to improve their satisfaction by working on one-dimensional and attractive requirements.

### Conclusion

The purpose of this study was to identify and classify the student requirements as the first-rank customers of higher education and to determine the role of each of these requirements in their satisfaction. In a general view, it is concluded that improvement should be done in one-dimensional, and must-be requirements respectively. Because when customer’s needs are not met in this section, student’s dissatisfaction will rise and their motivation and endeavor will mostly reduce. Universities should consider through these factors competitors can be come over??. Between factors of one-dimensional requirement, those that have the greatest importance to students and they are satisfied with them should be emphasized. Totally, this study can help the authorities prioritize their policies, strategies and decisions in order to improve and guarantee the higher education quality and extremity obtains customer satisfaction.

This research indicated that fuzzy logic can be used for a specific purpose in modeling clinical nutritional screen based on the general capability. Therefore, CDSSs based

on fuzzy logic can be considered as a screening and supportive tool for diagnosis of nutritional status in order to improve patient care. This system can be used in all hospitals and for all inpatients on admission by clinical nutritionists.

### Study limitations

It is of note that this study had some limitations. First of all, it just focused on the students’ viewpoints and did not consider other groups, including the educational services staff and professors. Besides, we used a closed questionnaire and, as a result, some aspects might have been missed. Therefore, future studies are recommended to use individual or group interviews for achieving further viewpoints of the other customers in this university.

### Acknowledgement

The present article was financially supported by Shiraz University of Medical Sciences, Shiraz, Iran (Contract No. 92-6479). Hereby, the authors would like to thank the university’s Student Research Committee and the staff and students of Shiraz University of Medical Sciences for their help and support.

### Conflict of Interest

The authors declare that they have no conflict of interest.

### References

1. Butt BZ, Rehman Ku. A study examining the students satisfaction in higher education. *Procedia - Social and Behavioral Sciences*. 2010;2(2):5446-50.
2. Nien-Te K, Chang KC, Lai CH. Identifying critical service quality attributes for higher education in hospitality and tourism: Applications of the Kano model and importance-performance analysis (IPA). *African Journal of Business Management*. 2011;5(30):12016-24.
3. Dragut BM. Quality management in higher education services. *Procedia - Social and Behavioral Sciences*. 2011;15:3366-8.
4. Yarmohammadian MH, Mozaffary M, Esfahani SS. Evaluation of quality of education in higher education based on Academic Quality Improvement Program (AQIP) Model. *Procedia - Social and Behavioral Sciences*. 2011;15:2917-22.
5. Arefi M, Heidari M, Morkani GS, Zandi K. Application of Kano Model in Higher Education Quality Improvement: Study Master’s Degree Program of Educational Psychology in State Universities of Tehran. *World Applied Sciences Journal*. 2012;17(3):347-53.
6. Danjum I, Rasli A. Imperatives of service innovation and service quality for customer satisfaction: Perspective on higher education. *Procedia - Social and Behavioral Sciences*. 2012;40:347-52.
7. Temizer L, Turkyilmaz A. Implementation of Student Satisfaction Index Model in Higher Education Institutions. *Procedia - Social and Behavioral Sciences*. 2012;46:3802-6.
8. Baki B, Basfirinci CS, Ar IM, Cilingir Z. An application of integrating SERVQUAL and Kano’s model into QFD for logistics services: A case study from Turkey. *Asia Pacific Journal of Marketing and Logistics*. 2009;21(1):106-26.
9. Singh V, Grover S, Kumar A. Evaluation of quality in an educational institute: a quality function deployment approach. *Educational Research and Review*. 2008;3(4):162-8.
10. Cardona MM, Bravo JJ. Service quality perceptions in higher education institutions: the case of a colombian university. *Estudios Gerenciales*. 2012;28(125):23-9.
11. Wang T, Ji P. Understanding customer needs through quantitative analysis of Kano’s model. *International Journal of Quality & Reliability Management*. 2010;27(2):173-84.

12. Bilgili B, Erciş A, Ünal S. Kano model application in new product development and customer satisfaction (adaptation of traditional art of tile making to jewelries). *Procedia - Social and Behavioral Sciences*. 2011;24:829-46.
13. Chen L-H, Kuo Y-F. Understanding e-learning service quality of a commercial bank by using Kano's model. *Total Quality Management*. 2011;22(1):99-116.
14. Hashim AM, Dawal SZM. Kano Model and QFD integration approach for Ergonomic Design Improvement. *Procedia - Social and Behavioral Sciences*. 2012;57:22-32.
15. Mirfakhrodini h, owlia ms, jamali r. Quality Management Reengineering in Higher Education Institutions, Case Study: Graduate Students of University of Yazd. *Quarterly journal of Research and Planning in Higher Education*. 2009;53:131- 57. persian.
16. Bahadori M, Sadeghifar J, Nejati M, Hamouzadeh P, Hakimzadeh M. Assessing Quality of Educational Service by the SERVQUAL model: Viewpoints of Paramedical Students at Tehran University of Medical Science. *TTEM-Technics Technologies Education Management*. 2012;6(4).
17. Lai H-I, Wu H-H. ANOVA Technique in Evaluating Service Quality. *Information Technology Journal*. 2011;10(1):89-97.
18. Abari AAF, Yarmohammadian MH, Esteki M. Assessment of quality of education a non-governmental university via SERVQUAL model. *Procedia - Social and Behavioral Sciences*. 2011;15:2299-304.
19. Akhlaghi E, Amini S, Akhlaghi H. Evaluating Educational Service Quality in Technical and Vocational Colleges using SERVQUAL Model. *Procedia - Social and Behavioral Sciences*. 2012;46:5285-9.
20. Barnes BR. Analysing service quality: the case of post-graduate Chinese students. *Total Quality Management & Business Excellence*. 2007;18(3):313-31.
21. Husain F, Hanim S, Fernando Y, Nejati M. Education Service Delivery and Students' Satisfaction: A Study of Private Colleges in Malaysia. *Global Business & Management Research*. 2009;1(1):64- 72.
22. Kazemi M, Rajabi B, Pirani P, Amini A. Identify and Ranking Factors Affecting Bank Maskan Service Quality using Kano Model. *Research Journal of Recent Sciences*. 2013;2(4):1-8.
23. Iran Nejad Parizi M, Sassangohar p. *Organization and Management: theory and practice*. Iran-Tehran: Iran Banking Institute, Central Bank of the Islamic Republic of Iran; 2007. 641 p.